

CLAIMS

I claim

1. A device for sealing a rotatable shaft and a fixed housing, said device comprising an annular stator and an annular rotor, said stator having a seal means for forming a seal with said housing, said rotor having a seal means for forming a seal with said shaft, said rotor and said stator each having contact faces, said device having a means to mechanically couple said rotor to said stator so that said rotor moves axially independently of said stator for a predetermined range and once said predetermined range is exceeded, said rotor axial movement is coupled to said stator axial movement, and at least one magnet urging said contact faces together to form a seal when said stator and said rotor contact faces are in contact.
2. A device for sealing a rotatable shaft and a fixed housing, said device comprising an annular stator and an annular rotor, said stator having a seal means for forming a seal with said housing, said rotor having a seal means for forming a seal with said shaft, said rotor and said stator each having contact faces, said device having a means to mechanically couple said stator and said rotor to allow said rotor to axially slide along said shaft, and at least one magnet urging said contact faces together to form a seal when said stator and said rotor contact faces are in contact.
3. A device according to claim 1 where said means to mechanically couple includes an interlocking flange and annular groove, said flange positioned on one of said rotor or said stator, said annular groove positioned on the other of said rotor or said stator.

4. A device according to claim 3 where said annular groove is positioned on said stator and said flange is positioned on said rotor.

5. A device according to claim 3 where said annular groove is positioned on said rotor and said flange is positioned on said stator.

6. A device for sealing a rotatable shaft and a fixed housing, said device comprising a mechanically coupled stator and rotor, said rotor and said stator each having a contact face, said rotor being constructed substantially of a semi-flexible heat-resistant material, and at least one magnet positioned on said rotor urging said contact faces together to form a seal between said stator and said rotor when said contact faces are in contact.

7. A device for sealing a rotatable shaft and a fixed housing, said device comprising a stator and a rotor, said device having a means to mechanically couple said stator and said rotor, said rotor and said stator each having a contact face, at least one magnet for urging said contact faces together to form a seal between said stator and said rotor when said contact faces are in contact, said means to mechanically couple said stator and said rotor forming a labyrinth between said stator and said rotor.

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8. A shaft seal according to claim 6 wherein each of said plurality of magnets is positioned in a cavity on said rotor, each of said cavities having an epoxy channel having a bottom which opens into said cavity, each of said epoxy channels further having a top portion, where said

top portion is of larger cross-sectional area than said bottom, and epoxy positioned in said epoxy channel to hold said magnets in said cavities.

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5 A device for sealing a rotatable shaft and a fixed housing, said device comprising an annular stator and an annular rotor, said stator having a seal means for forming a seal with said housing, said rotor having a seal means for forming a seal with said shaft, said rotor and said stator each having contact faces, said device having an annular groove positioned on one of said stator or said rotor, and a flange positioned on the other of said stator or said rotor, said annular groove and said flange co-operating to mechanically couple said rotor to said stator so that said rotor moves axially independently of said stator for a predetermined range and once said predetermined range is exceeded, said rotor axial movement is coupled to said stator axial movement, and at least one magnet urging said contact faces together to form a seal between said stator and said rotor when said contact faces are in contact.

10. A device according to claim 1 having a plurality of magnets.

11. A device according to claim 3 wherein said flange and said annular groove have substantially complementary cross-sectional profiles.

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